

IN THE CLAIMS

1. (Original) An RF semiconductor device comprising:  
a high resistivity polysilicon handle wafer;  
a buried oxide layer over the polysilicon handle wafer; and,  
a silicon layer over the buried oxide layer.

2. (Original) The RF semiconductor device of claim 2 further comprising an RF input.

3. (Original) An RF semiconductor device comprising:  
a high resistivity polycrystalline layer;  
a buried oxide layer over the polycrystalline layer; and,  
a silicon layer over the buried oxide layer.

4. (Original) The RF semiconductor device of claim 3 wherein the polycrystalline layer comprises a polysilicon layer.

5. (Original) The RF semiconductor device of claim 3 further comprising an RF input.

6. (Original) The RF semiconductor device of  
claim 5 wherein the polycrystalline layer comprises a  
polysilicon layer.

7-21 (canceled)

22. (Withdrawn) A method of fabricating an RF  
semiconductor device starting with a SOI wafer having a  
top silicon layer, a buried oxide layer, and a bottom  
silicon layer, the method comprising:

forming a new oxide layer on a surface of the  
top silicon layer;

forming a high resistivity polysilicon layer  
over the new oxide layer;

removing the bottom silicon layer of the SOI  
wafer; and,

removing the buried oxide layer of the SOI  
wafer so as to produce the RF semiconductor device.

23. (Withdrawn) The method of claim 22  
wherein the forming of a polysilicon layer over the new  
oxide layer comprises depositing a polysilicon layer on  
the new oxide layer.

24. (Withdrawn) The method of claim 23  
wherein the removing of the bottom silicon layer of the  
SOI wafer comprises grinding and/or etching away the  
bottom silicon layer of the SOI wafer.

25. (Withdrawn) The method of claim 23  
wherein the removing of the buried oxide layer of the SOI  
wafer comprises grinding and/or etching away the buried  
oxide layer of the SOI wafer.

26. (Withdrawn) The method of claim 25  
wherein the removing of the bottom silicon layer of the  
SOI wafer comprises grinding and/or etching away the  
bottom silicon layer of the SOI wafer.

27. (Withdrawn) The method of claim 22  
wherein the removing of the bottom silicon layer of the  
SOI wafer comprises grinding and/or etching away the  
bottom silicon layer of the SOI wafer.

28. (Withdrawn) The method of claim 22 wherein the removing of the buried oxide layer of the SOI wafer comprises grinding and/or etching away the buried oxide layer of the SOI wafer.

29. (Withdrawn) The method of claim 28 wherein the removing of the bottom silicon layer of the SOI wafer comprises grinding and/or etching away the bottom silicon layer of the SOI wafer.

30. (Withdrawn) The method of claim 22 further comprising processing the silicon remaining from the SOI wafer so as to form an integrated circuit of the RF semiconductor device therein.

31. (Withdrawn) The method of claim 22 further comprising processing the silicon remaining from the SOI wafer so as to form transistors and inductors.

32. (new) The RF semiconductor device of claim 1 wherein the high resistivity polysilicon handle wafer comprises a high resistivity polysilicon handle wafer having a resistivity  $\rho$  greater than  $10^6 \Omega\text{-cm}$ .

33. (new) The RF semiconductor device of  
claim 1 wherein the silicon layer comprises an RF  
processed silicon layer.

34. (new) The RF semiconductor device of  
claim 3 wherein the high resistivity polycrystalline  
handle wafer comprises a high resistivity polycrystalline  
handle wafer having a resistivity  $\rho$  greater than  $10^6 \Omega\text{-}$   
cm.

35. (new) The RF semiconductor device of  
claim 3 wherein the silicon layer comprises an RF  
processed silicon layer.